

CLAIMS

1 1. An engineered welded blank, comprising:

2 a first sheet metal piece having a first side, a second side and at
3 least one edge,

4 a second sheet metal piece having a first side, a second side and at
5 least one edge that is thicker than said edge of said first piece, wherein said
6 first and second sheet metal pieces abut one another along an interface of said
7 edges, and

8 a weld seam extending along at least a portion of said interface,
9 wherein said first sides of said first and second sheet metal pieces are flushly
10 aligned along a first segment of said interface and said second sides of said
11 first and second sheet metal pieces are flushly aligned along a second segment
12 of said interface.

1 2. The engineered welded blank of claim 1, wherein said edges of
2 said first and second pieces extend in a non-parallel manner, with respect to
3 one another, between said first and second segments.

1 3. The engineered welded blank of claim 1, wherein said interface
2 extends along a generally linear path between said first and second segments.

1 4. The engineered welded blank of claim 1, wherein said interface
2 extends along a generally non-linear path between said first and second
3 segments.

1 5. The engineered welded blank of claim 1, wherein said blank
2 further includes one or more additional segments where said first sides of said
3 first and second sheet metal pieces are flushly aligned.

1 6. The engineered welded blank of claim 1, wherein said blank
2 further includes one or more additional segments where said second sides of
3 said first and second sheet metal pieces are flushly aligned.

1 7. The engineered welded blank of claim 1, wherein said
2 engineered welded blank is a laser welded blank.

1 8. A vehicle door panel assembly that comprises the engineered
2 welded blank of claim 1.

1 9. An engineered welded blank, comprising:

2 a first sheet metal piece having an outer side, an inner side and a
3 first edge,

4 a second sheet metal piece having an outer side, an inner side and a
5 second edge, wherein said first and second edges have unequal thicknesses
6 and abut one another along an edge-to-edge interface, and

7 a weld seam extending along at least a portion of said interface,
8 wherein a first segment of said interface is stepped between said inner sides of
9 said first and second sheet metal pieces and a second segment of said interface
10 is stepped between said outer sides of said first and second sheet metal pieces.

1 10. The engineered welded blank of claim 9, wherein said first and
2 second edges extend in a non-parallel manner, with respect to one another,
3 between said first and second segments.

1 11. The engineered welded blank of claim 9, wherein said
2 interface extends along a generally linear path between said first and second
3 segments.

1 12. The engineered welded blank of claim 9, wherein said
2 interface extends along a generally non-linear path between said first and
3 second segments.

1 13. The engineered welded blank of claim 9, wherein said edge-to-
2 edge interface further includes at least one additional segment that is stepped
3 between said inner sides of said first and second sheet metal pieces.

1 14. The engineered welded blank of claim 9, wherein said edge-to-
2 edge interface further includes at least one additional segment that is stepped
3 between said outer sides of said first and second sheet metal pieces.

1 15. The engineered welded blank of claim 9, wherein at least one
2 of said first and second segments is located at least partially beyond either said
3 inner side or said outer side of said second sheet metal piece, thereby forming
4 a negative step.

1 16. The engineered welded blank of claim 9, wherein said first
2 segment is a negative step located at least partially beyond said inner side of
3 said second sheet metal piece and said second segment is a negative step
4 located at least partially beyond said outer side of said second sheet metal
5 piece.

1 17. The engineered welded blank of claim 9, wherein said
2 engineered welded blank is a laser welded blank.

1 18. A vehicle door panel assembly that comprises the engineered
2 welded blank of claim 9.

1 19. A door panel assembly for use on a vehicle, comprising:
2 an inner door panel including:
3 a thick sheet metal piece for reinforcing a portion of the inner
4 door panel, said thick piece having an outer side, an inner side and an edge,
5 a thin sheet metal piece having an outer side, an inner side and
6 an edge that is thinner than said edge of said thick piece, wherein said thick
7 and thin sheet metal pieces abut one another along an interface of said edges,
8 said interface includes a first segment where said inner sides of said thick and
9 thin pieces are flush with each other and a second segment where said outer
10 sides of said thick and thin pieces are flush with each other, and;
11 a laser welded seam extending along at least a portion of said
12 interface;
13 an outer door panel, and;
14 a seal extending along at least a portion of the periphery of said
15 door panel assembly;
16 wherein said seal extends across said interface at said first segment
17 and said outer door panel contacts said interface at said second segment.

18
1 20. A method of manufacturing an engineered welded blank, said
2 method comprising the steps of:
3 (a) providing first and second sheet metal pieces, said first sheet
4 metal piece having a mating edge that is thinner than a mating edge of said
5 second sheet metal piece,
6 (b) bringing said mating edges together along an interface while
7 maintaining said second sheet metal piece in a non-planar alignment, and
8 (c) welding said first and second sheet metal pieces together along
9 said interface.

1 21. The method stated in claim 20, wherein step (b) further
2 comprises bringing said mating edges together such that first sides of said first
3 and second sheet metal pieces are flushly aligned along a first segment of said
4 interface.

1 22. The method stated in claim 21, wherein step (b) further
2 comprises bringing said mating edges together such that second sides of said
3 first and second sheet metal pieces are flushly aligned along a second segment
4 of said interface.

1 23. The method stated in claim 22, wherein step (b) further
2 comprises bringing said mating edges together such that said edges extend
3 between said first and second segments along said interface in a non-parallel
4 manner, with respect to one another.

1 24. The method stated in claim 22, wherein step (b) further
2 comprises bringing said mating edges together such that said interface extends
3 along a generally non-linear path between said first and second segments.

4 25. The method stated in claim 20, wherein step (c) further
5 comprises laser welding said first and second sheet metal pieces together
6 along said interface.